IN THE UNITED STATES DISTRICT COURT

FOR THE NORTHERN DISTRICT OF OKLAHOMA

STATE OF OKLAHOMA, ex rel, W.A. DREW EDMONDSON, in his capacity as ATTORNEY GENERAL OF THE STATE OF OKLAHOMA, et al.	)	
Plaintiffs,	)	
V.	)	No. 05-CV-329-GKF-SAJ
TYSON FOODS, INC., et al.,	)	
Defendants.	)	

REPORTER'S TRANSCRIPT OF PROCEEDINGS

FEBRUARY 22, 2008

PRELIMINARY INJUNCTION HEARING

VOLUME IV

BEFORE THE HONORABLE GREGORY K. FRIZZELL, Judge

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February 22, 2008

THE COURT: Dr. Olsen, if you will retake the stand. Mr. George, you may resume.

MR. GEORGE: Thank you, Your Honor.

ongoing; correct?

A. Yes, sir.

Q. Did you take those samples and have those samples analyzed to determine the presence, absence and concentration of the 25 parameters that you are using in your chemical signature for poultry?

A. No, we did not.

Q. Why not?

A. At the time, that was -- the program was designed specifically for qPCR.

Q. Dr. Olsen, who actually set up your computer program and all of the statistical language and macros that's involved with that to run the PCA analysis?

A. Dr. Rick Chappell.

Q. Dr. Rick Chappell is no longer with your firm, is he?

A. No, he is not.

Q. Sir, let me hand you what we've marked as Demonstrative Exhibit 34 which is, sir, a treatise entitled Introduction to Environmental Forensics. And I'll ask you to take a moment and look through that. The listed author is Brian Murphy and Robert Morrison. Sir, have you ever had occasion to consult this particular treatise?

A. No, I have not.

Q. I'm going to read some statements out of it and just ask -- that discussed PCA and some of its limitations and ask

whether you agree with them. Let's start, if we can, on page 5 -- it's listed 510, the summary section.

MR. GEORGE: And by the way, for the record, Your Honor, what I put in front of the witness and I provided a copy, of course, to counsel for plaintiffs, is the cover page, the copyright page, and then this is actually a multi-chapter treatise. I've included the chapter on principal component analysis which is Chapter 12.

THE COURT: Yes, sir.

Q. (By Mr. George) Do you see at the bottom of page 510 in the summary section on principal component analysis, sir, the very last paragraph. There should be some highlighted language in your copy, is there?

A. There's two highlights, which are you referring to?

Q. Let's talk about the last one first. Let me read it and I want to ask you if you agree with this. "PCA, the earliest of the procedures discussed in this chapter, works best in simple cases where there are few sources contributing to the system and there's limited mixing between sources. If an initial PCA indicates the presence of mixtures, it is usually best to move to a data analysis method capable of resolving the nature of that mixture." Do you see that?

A. No, I don't see where you are reading at all, sir.

Q. Sorry, it's on the screen, it be highlighted. Let me look at your copy to make sure you have one that's highlighted.

Yours is not highlighted for some reason.

A. I didn't follow you at all there.

Q. Let me do it again, I want you to follow me. I want to read it and it should be on your screen highlighted, Dr. Olsen. It might be easier to look at your screen. "PCA, the earliest of the procedures discussed, works best in simple cases where there are few sources contributing to the system and there is limited mixing between sources. If an initial PCA indicates the presence of mixtures, it is usually best to move to a data analysis method capable of resolving the nature of that mixture." Do you see that?

A. Yes, I do.

Q. Do you agree with that statement?

A. Let me read that again. Let's see. Works best for simple cases where there are few sources contributing to the system. Again, we only have a few sources here contributing to the system. I wouldn't say it's a simple case. I think PCA works for these very complex cases. And there is limited mixing between the sources. Actually, we didn't find a lot of mixing between the sources. It was very clear when we had mixing and when we didn't and we could identify that mixing. And overall, there was limited mixing of the sources in our analysis and that's very clear when we did the PCA scores on everything and compared scores 1 and 2.

Q. Dr. Olsen, so if I understand what you've just said, you

believe that the Illinois River Watershed is a system which only receives input of the things on your list of parameters from a few sources, two?

A. No, there's three major sources out there and we were able to identify two. And we were able to identify when those two sources mixed together and we see that out there frequently. There is a third source, cattle source. We were able to identify specific samples of where that was and those few specific samples were mixed with the other samples. So I would say there was limited mixing overall and we could identify where that was.

Q. Dr. Olsen, if you could turn back a few pages to page 464 in this treatise. There should be a highlighted paragraph which I'm going -- we can read it all, but I'm interested in some particular things. You'll see it on your screen, Dr. Olsen, but I'll certainly give you time to find it in your paper, too. Do you have page 464 in front of you?

A. Yes, I do.

Q. Do you see the first paragraph?

A. Yes.

Q. I'm going to read some portions of that paragraph and then ask you whether you agree, sir.

"Regardless of the data analysis strategy chosen, another important consideration is the presence of bad or questionable data. Common problems with environmental chemical

data include the following: Chemical analysis performed by different laboratories or by different methods which may introduce a systemic bias, the presence of data at concentrations at or below method detection limits, the presence of coelution, the ever-present problem of error in data entry, data transcription or peak integration."

And Then dropping down, sir, to the first two sentences of the second paragraph. "Unfortunately such errors rarely manifest themselves as random noise. More often, they contribute strong systemic variability. If unrecognized, the result may be a derivation of 'fingerprints,' which have little to do with true sources."

Do you see that language, sir?

A. Yes, I do.

Q. Do you agree with that as a description of the problems associated with bad or highly variable data used in a PCA analysis?

A. With bad data, not with -- with bad data, not with high variability data. I mean, you're looking for data that has a lot of variability.

Q. Poor term on my part. What about biased data?

A. Yes, and all these four things that are listed here, we checked very carefully in our analysis when we did them.

Q. Dr. Olsen, there were multiple laboratories who ran analysis that the results of which were used in your PCA;

correct?
A. Yes, but those laboratories were always doing the same set of analysis, sir. So there wasn't like a variety of labs doing the same analysis. So the same lab did all the different analysis so it's --
Q. Sir, your counsel will give you a chance to elaborate. Please answer my question so my time is not all consumed. Dr. Olsen, how many laboratories were involved in the results that you used in your PCA analysis?
A. Three.
Q. Okay. Just three?
A. Yes, one for the bacteria, one for the phosphorus and one for all the other parameters, that's just three.
Q. Can you list those three labs for us?
A. Yes, Environmental Microbiological Laboratories did the bacterial analysis, Aquatic Research did the phosphorus analysis, and A & L did the rest of the analysis, all the metals and the general water quality parameters.
Q. Sir, you left out FoodProtech, did you not?
A. Yes, I left out -- they did some analysis up front, but because they had bad data, we dropped them very quickly.
Q. How quickly did you drop the FoodProtech data?
A. Oh, that was within probably a half a year after we started, five or six months. So there is some FoodProtech data left in our analysis and I forgot to mention that, I'm sorry,

but it's a very small amount.
Q. Even after the problem with FoodProtech was identified and their bacteria data was rejected by Dr. Harwood, you continued to use the results of samples run by FoodProtech in your PCA analysis; correct?
A. No, that's not correct. She did not reject all the data. In fact, at her suggestion they actually changed one of their procedures. So after that time, there was some good data and there was only two or three of the actual analyses out of the seven they were performing that she actually rejected.
Q. You're continuing to use FoodProtech data in your PCA analysis?
A. Just the valid data is all that we're using, sir.
Q. When did Dr. Olsen determine that the bacteria data produced by FoodProtech was invalid?
A. I did not determine that.
Q. I'm sorry, when did Dr. Harwood determine that?
A. I can't remember. We got her involved early, but I think it's consistent with what I said. It was still the first year that we were sampling. And I'd actually started to use EML so we had some comparison. So it was probably in late 2005, sometime in that time frame, mid 2000 -- to autumn 2005.
Q. Sir, you said you testified that you dropped the FoodProtech data from the PCA analysis that had been rejected by Dr. Harwood; correct?

A. Yes, I did for the most recent runs.
Q. Sir, how many PCA runs in support of your chemical signature analysis did you perform with the rejected FoodProtech data still in there?
A. There were a substantial number until I discovered that some of that rejected data was still there.
Q. Let's quantify. You're up to PCA run 9 today; correct?
A. I don't have any recollection what you mean by PCA run 9. There's been lots of runs and we didn't number them like that.
Q. Do you quarrel with the notion that you've run your PCA at least nine times?
A. We've run it -- no, we've run it hundreds of times, sir.
Q. So you ran your PCA database analysis hundreds of times?
A. Yes.
Q. With the FoodProtech rejected data?
A. No, I didn't say that. I said overall we've run it that many times.
Q. Well, sir, you just pulled out the FoodProtech data about two weeks ago; correct?
A. Yes, and we've done substantial runs since that time to verify that everything was still valid.
Q. Have you run it hundreds of times since then?
A. No, I didn't testify to that, sir.
Q. And every time that you ran that PCA analysis with the rejected FoodProtech data in it, you saw the chemical signature